FIBRE-REINFORCED PRESSURE VESSEL AND METHOD OF MANUFACTURING A FIBRE-REINFORCED PRESSURE VESSEL

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The invention relates to a fibre-reinforced pressure vessel comprising a rigid gas-or fluid-tight body overwound with fibre filaments. The invention also relates to a method of manufacturing a fibre-reinforced pressure vessel comprising a rigid gas- or fluid-tight body overwound with fibre filaments.

Known fibre-reinforced pressure vessels comprise a rigid gas- or fluid-tight body overwound with fibre filaments. During the manufacturing of fibre-reinforced pressure vessels fibre filaments are applied in certain patterns, so that when the pressure vessel is under internal pressure the fibre filaments can absorb tensil stresses. Prior to, during or after winding, a binder or resin (a so-called matrix material) is applied to the body which is (to be) overwound or to the fibre filaments. After winding, the matrix material is cured so that the fibre filaments are incorporated in a matrix (the binder or resin). In fibre-reinforced pressure vessels the matrix serves to transfer shear stresses from one fibre filament to another or to the gas- or fluid-tight body when the pressure vessel is under internal pressure. Sometimes extra windings are applied to (sections of) the gas- or fluid-tight body in order to absorb mechanical loads resulting from inter alia shear stresses.

Known methods of manufacturing fibre-reinforced pressure vessels comprise a solidification or curing step in order to incorporate the wound fibre filaments in a matrix. Curing takes time, usually 6 to 8 hours.

A disadvantage of known pressure vessels and methods of manufacturing the same is the need for a solidification or curing step which usually last 6 to 8 hours. Another disadvantage is that for absorbing mechanical loads resulting from inter alia shear stresses extra windings are sometimes necessary.

It is an objective of the invention to provide an improved pressure vessel. It is another objective of the invention to provide a reduction of production costs of fibre-reinforced pressure vessels. It is yet another objective of the invention to provide an improved method of manufacturing fibre-reinforced pressure vessels.

According to a first aspect of the invention one or more objectives are achieved with a fibre-reinforced pressure vessel comprising a rigid gas- or fluid-tight body overwound with fibre filaments, whereby at least a number of fibre filaments can move freely with respect to one another and the fibre filaments are wound such that when the pressure vessel is under internal pressure the fibre filaments are loaded exactly in their longitudinal direction.